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The Timber Industries of Southern New England— A Periodic Assessment of Timber Output

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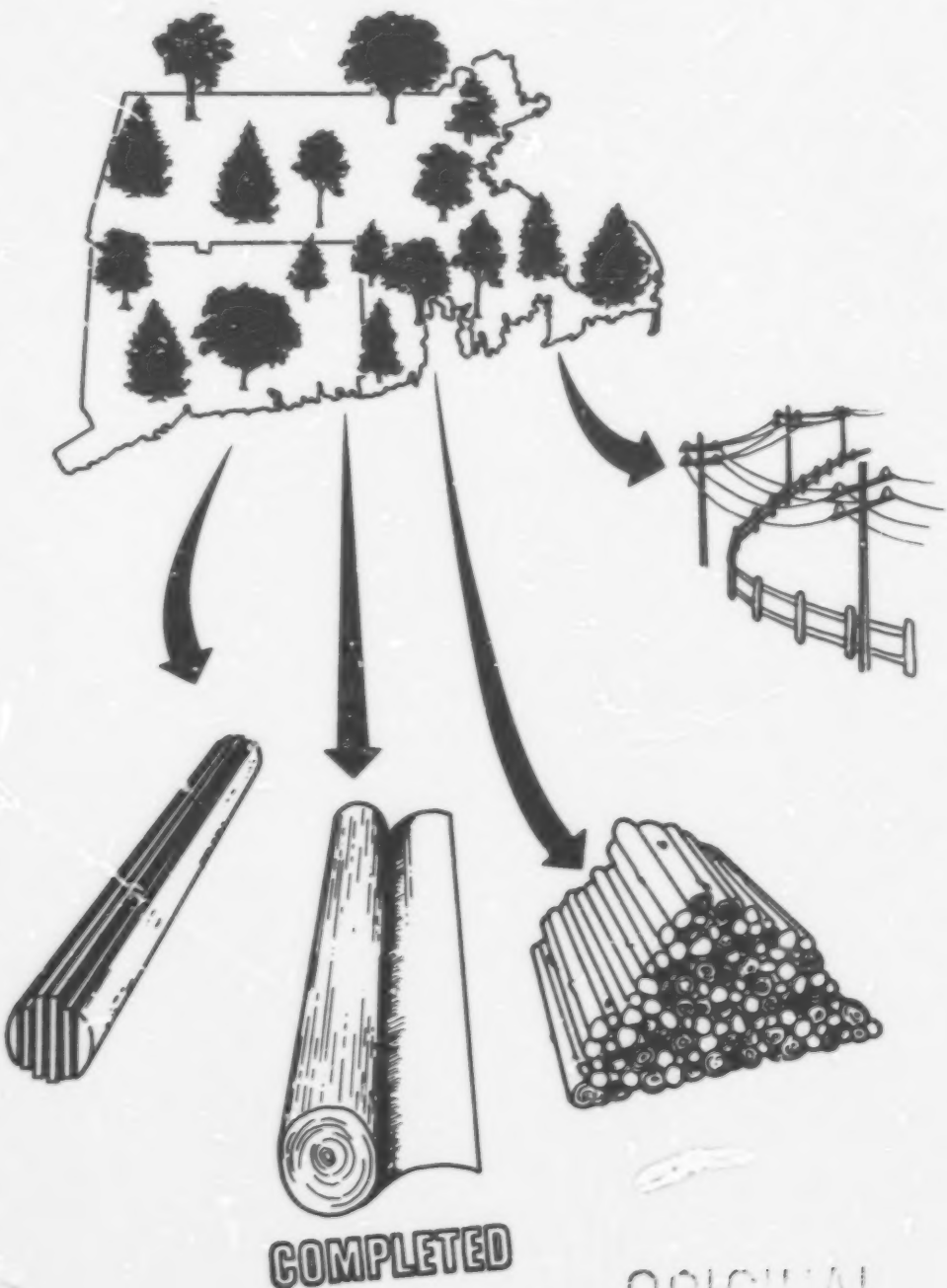

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Abstract

During 1984, 35.1 million cubic feet of sawlogs and other industrial timber products were harvested in southern New England timberlands. The volume produced in the region--Connecticut, Massacushetts, and Rhode Island--in 1984 was a 70 percent increase in production since 1971, when similar information was collected in detail. Production and receipts of sawlogs increased in each state during the period. The region's sawmills generated 18.9 million cubic feet of bark and wood residues in 1984--nearly all of which was used for wood fiber, fuel, and agricultural uses.

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Highlights

The 1984 timber industry canvass in southern New England showed that:

In Connecticut, since 1971:

- Total timber products output nearly doubled, increasing by 99 percent to 11.6 million cubic feet (328,000 m^3).
- Sawlog production much more than doubled, jumping by 150 percent to 69.3 million board feet.
- The number of operating sawmills increased by 22 to 85.
- Production of all forms of pulpwood declined by 36 percent to 6.9 thousand cords as wood fiber requirements changed. Roundwood production dropped by nearly three-fourths to 3,000 cords, while the production of residue chips rose from almost zero to 3.9 thousand cords.
- Combined production of other products, such as cabin logs, poles, and veneer logs and bolts nearly doubled to 433,000 cubic feet.
- Nearly all of the total available manufacturing plant residues, especially the fine materials were used. The proportion of coarse sawmill residues used rose from 75 to 97 percent.

In Massachusetts, since 1971:

- Total timber products output jumped by 65 percent to 22.5 million cubic feet (637,000 m^3).
- Sawlog production nearly doubled to 134.5 million board feet.
- The number of operating sawmills decreased by 7 to 116.
- Production of all forms of pulpwood fluctuated frequently and considerably. Roundwood production dropped slightly to 10.8 thousand cords, while the residue-chip volume rose by nearly one-half to 18.5 thousand cords.
- Combined production of other products, such as cabin logs, charcoal wood, veneer logs and bolts, and stock for the manufacture of dimension, shingles, rollers, and reconstituted-wood panels more than doubled to 682,000 cubic feet.
- Nearly all of the total available manufacturing plant residues were used. The proportion of coarse sawmill residues used rose from 65 to 97 percent.

In Rhode Island, since 1971:

- Total timber products output decreased by 12 percent to 1.1 million cubic feet (30,000 m^3).
- Sawlog production nearly doubled to 6.6 million board feet.
- The number of operating sawmills decreased by 3 to 16.
- Production of all forms of pulpwood dropped to zero by 1979 and remained there until 1984. In 1984, 1,600 cords of pulpwood chips from residues were produced by sawmills.
- The production of other products dropped by nearly a third to 13,000 cubic feet.
- Nearly all of the total available sawmill residues were used. The proportion of coarse residues used rose from 86 to 99 percent.

Background

The Forest Service of the U.S. Department of Agriculture conducts periodic forest surveys of all states to provide up-to-date information about the timber and related resources of the Nation. In the 14-state region served by the Northeastern Forest Experiment Station, all states have now been inventoried at least three times. The

latest inventory of southern New England, conducted during 1984, included a timber-industry canvass in 1984 to determine the output of timber products and the volume and disposition of primary wood-product plant manufacturing residues in Connecticut, Massachusetts, and Rhode Island.

This report is a result of determining this information for all primary wood-product manufacturers that were operating in the three states in 1984. Data were gathered by contacting the manufacturers, from information supplied by the states' forestry and forest utilization staffs, and from other canvasses of the timber-using industries in and near southern New England. Pulpwood and veneer bolt and log production were gathered as part of the Northeastern Station's periodic surveys of these roundwood products. In cooperation with the Connecticut Bureau of Forestry, the Massachusetts Division of Forests and Parks, and Rhode Island's Division of Forest Environment, the Station assembled a list of all known primary wood manufacturing firms that might have used industrial roundwood from these states in 1984.

These primary manufacturers were first contacted through a questionnaire mailed by the Northeastern Station. Two additional questionnaires were sent to nonrespondents. Nonrespondents from outside southern New England were then contacted by telephone by Station personnel. Rhode Island nonrespondents were contacted by the State Division of Forest Environment. Connecticut's Bureau of Forestry and Massachusetts' Division of Forests and Parks provided recent data on nonresponding mills: 1983 roundwood receipts and plant residues from Connecticut and 1984 production capacities from Massachusetts. These data were incorporated with the responding-mill data to allow complete regional industry coverage.

This report deals mainly with statistics for 1984, the year of the most recent inventory, and for 1971, the year of the last inventory of the timber resources of southern New England. Data for these years may not be representative for the various timber industries covered in this report. Documented production statistics for individual timber products, such as pulpwood and veneer logs, for intervening or previous years were included to facilitate comparisons. Future repeated canvasses will be required to disclose long-term production trends. Until an adequate data base is compiled over time, the reader is cautioned to use the most recent statistics prudently.

Industrial Timber Harvest

Between 1971 and 1984, the industrial timber harvest[1] in southern New England jumped by 70 percent from 20.7 to 35.1 million cubic feet (Table 1 and Fig.1). Regional timber harvests have increased substantially only in recent years (Fig. 2). In 1971, the harvest was 21 percent lower than that in 1952.

Most of the rise during the 1971-84 period was due to substantial rises in the harvests in Connecticut and Massachusetts (Fig. 3). Together, they accounted for 94 and 97 percent of the respective 1971 and 1984 regional harvests.

Massachusetts Produced Most

Traditionally, the timber harvest in New England has fluctuated with the harvests in Massachusetts. Although the timber harvests have increased steadily since 1952 in Connecticut and Rhode Island, the regional harvest decreased when the harvest in Massachusetts dropped between 1952 and 1971 (Fig. 2), and rose with the state's harvest between 1971 and 1984. In 1984, the timber harvest rose fastest in Connecticut (Fig. 1) and had

[1] Definitions of industrial timber harvest and other terms used in this report relating to the timber-using industries are found under Definition of Terms in the Appendix.

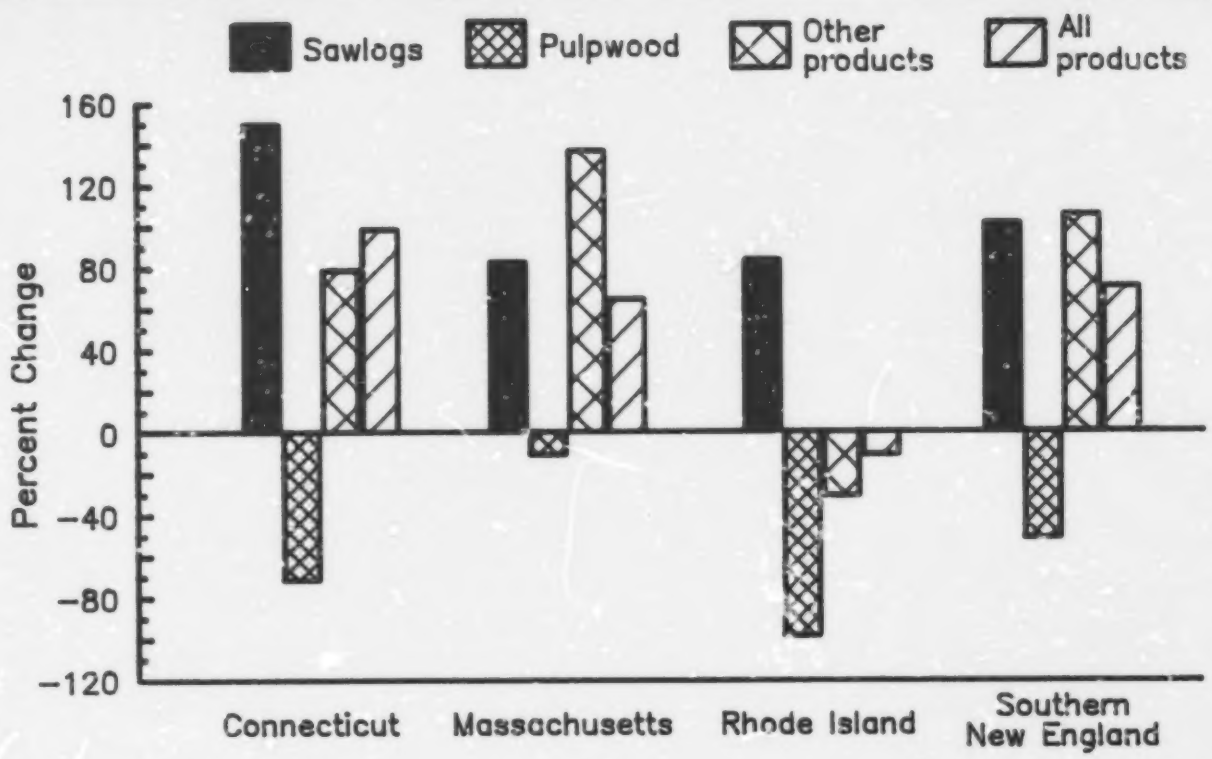

Figure 1.--Percentage of change in industrial timber harvests in southern New England between 1971 and 1984, by state and major product.

the greatest volume gain in Massachusetts (Figs. 2 and 3). In Massachusetts, where considerably more of the region's harvest traditionally is cut, industrial roundwood production increased by nearly two-thirds from 13,663 to 22,503 million cubic feet between 1971 and 1984. Increased roundwood production in Massachusetts accounted for 61 percent of the increase in the regional harvest. Though the timber harvest in Connecticut nearly doubled during the period, the volume gain from 5,803 to 11,574 million cubic feet was only about two-thirds of that for Massachusetts. In 1971, Massachusetts provided 66 percent of the regional harvest and Connecticut accounted for 28 percent; by 1984, Massachusetts provided 64 percent compared to 33 percent for Connecticut (Fig. 4).

Since 1971, the proportion of the regional timber harvest provided by Rhode Island dropped by half to 3 percent in 1984 when the volume cut in the state fell by 12 percent to 1.1 million cubic feet.

The rise of 433,000 cubic feet in Rhode Island's sawlog harvest between 1971 and 1984 was insufficient to offset the decline of 579,000 cubic feet in the production of pulpwood and other products (Fig. 2). In 1971, the 573,000 cubic feet of pulpwood from the state's forests rivaled the 607,000 cubic feet of sawlogs removed. By 1984, no pulpwood was cut in the state; and it was the only state in the region with decreased production of miscellaneous roundwood, such as poles, piling, and veneer logs, since 1952.

Sawlogs Were Most Important

Over the years, sawlogs have been the most important and the most widely harvested industrial timber product in southern New England. Throughout the region, since 1952, more sawlogs have been produced than all other products combined; and the rise and fall in

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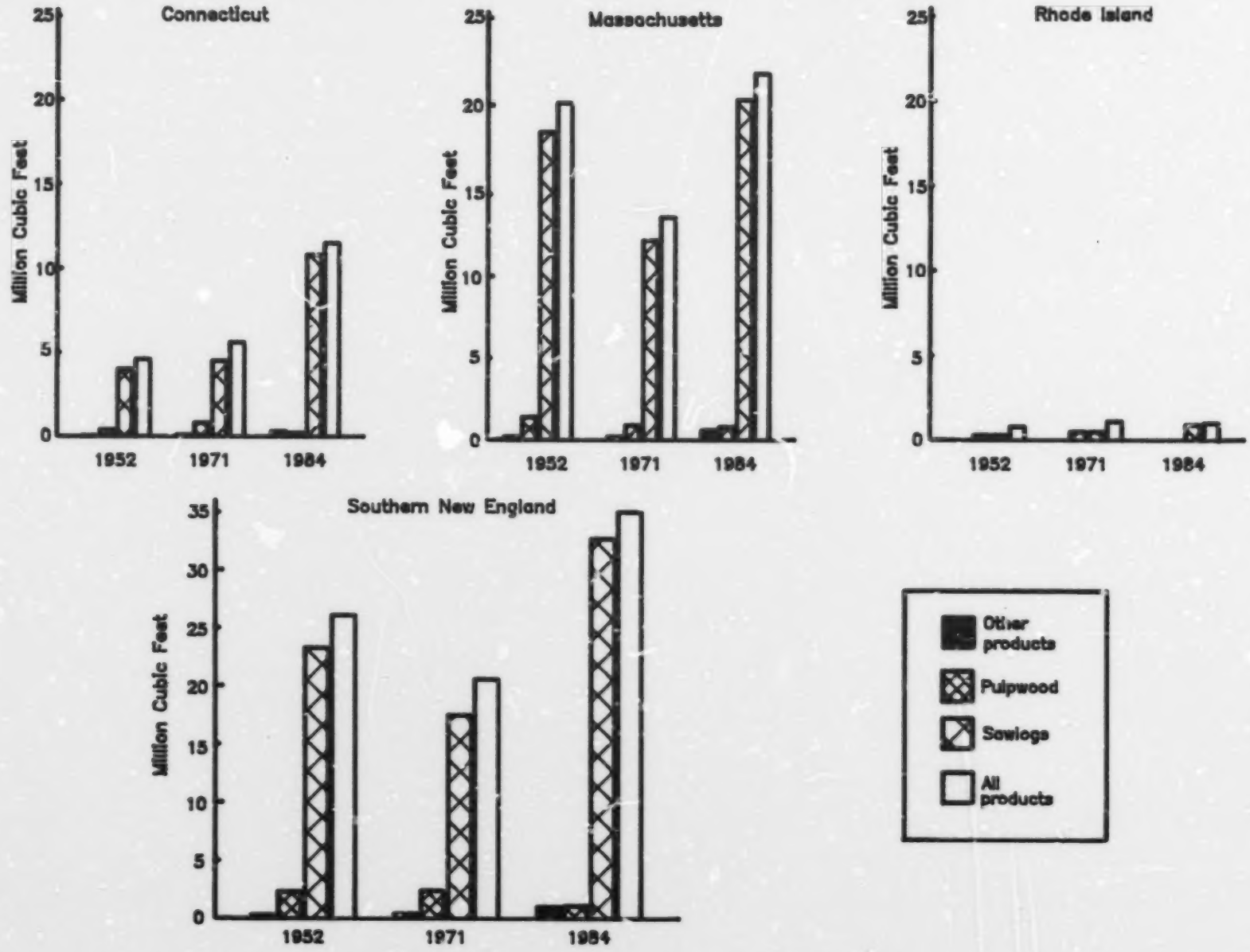

Figure 2.--Trends in industrial roundwood production in southern New England, by state and major product, 1952, 1971, and 1984.

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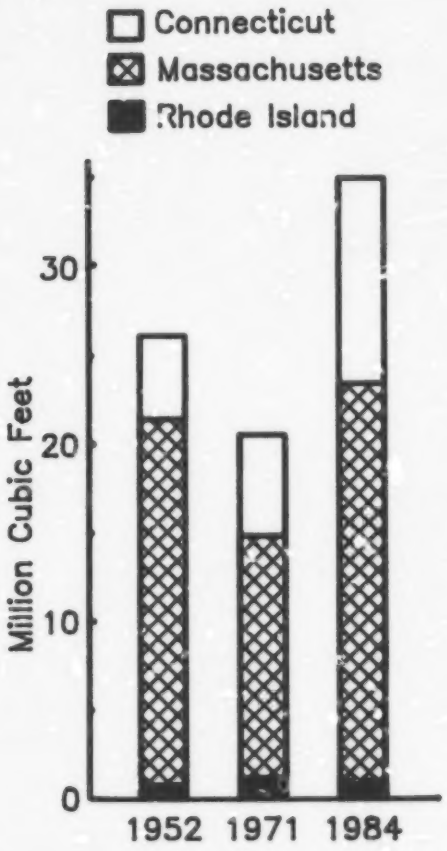

Figure 3.--Industrial timber harvests in southern New England, by state, 1952, 1971, and 1984.

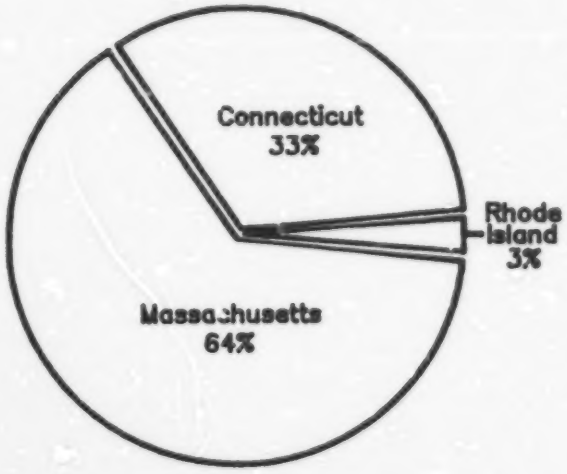

Figure 4.--Industrial timber harvest in southern New New England in 1984, by state, in percent.

sawlog production has been solely responsible for fluctuations in timber products output (Figs. 2 and 5).

In 1952, nearly nine-tenths of the timber harvested in southern New England was sawlogs. Between 1952 and 1971, the sawlog portion of the total harvest decreased slightly when the timber harvest dropped from a 25-percent reduction in sawlog production. By 1984, the sawlog portion rose to 93 percent of the harvest as the volume rise in the sawlog production exceeded the rise in total timber products output by 777 million cubic feet.

While the sawlog harvest decreased in the region between 1952 and 1971, the production of both pulpwood and miscellaneous products increased moderately in terms of volume and share of the total harvest (Figs. 2 and 5). The loss of the region's two pulpmills caused a severe reduction in the pulpwood harvest between 1971 and 1984. In 1984, more hardwood and softwood logs were being cut for plywood and reconstituted-wood panel plants; the timber harvest to supply these and other product manufacturers nearly equalled the pulpwood harvest; and the rise in miscellaneous production failed to offset the pulpwood loss. The harvest of roundwood to make woodpulp and other products, such as cabin logs, veneer, piling, poles, posts, rollers, and shingles accounted for about 6 percent of the region's 1984 industrial timber harvest (Fig. 6).

Hardwoods Continued to Gain

Both the volume and proportion of hardwoods harvested in the region have risen continually since 1952 (Fig. 7). In 1952, about one-third of the total timber harvest came from hardwood trees. By 1971, hardwoods accounted for 54 percent of the harvest, rising only slightly to 55 percent in 1984. Nearly six-tenths of the gain in the timber harvest between 1971 and 1984 was from the rise in hardwood products, mostly sawlogs.

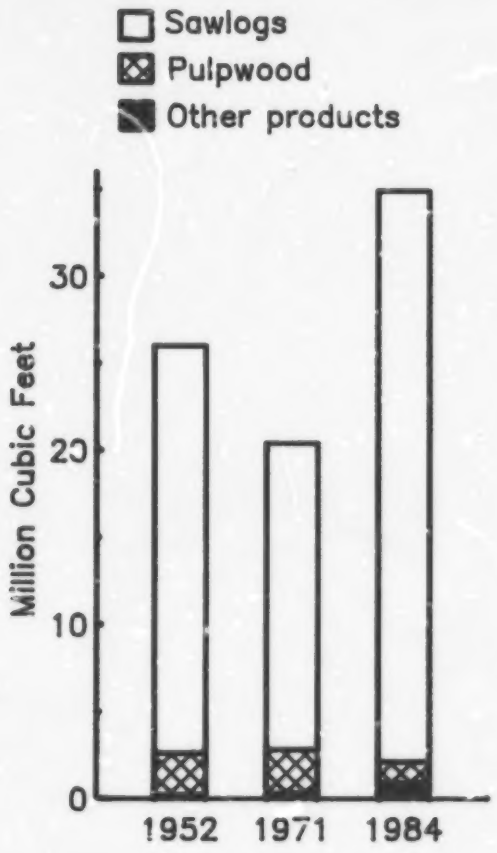

Figure 5.--Industrial timber harvests in southern New England, by major product, 1952, 1971, and 1984.

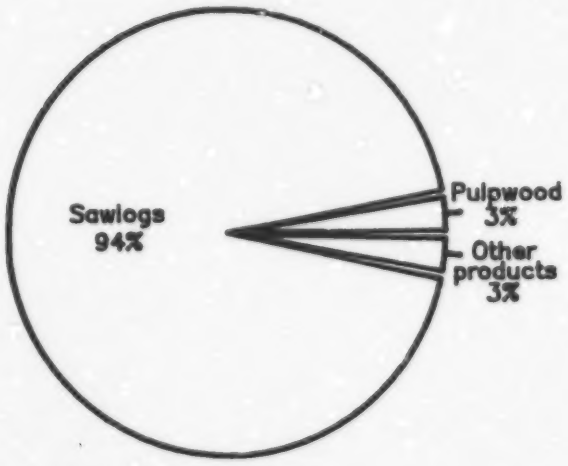

Figure 6.--Industrial timber harvest in southern New England in 1984, by major product, in percent.

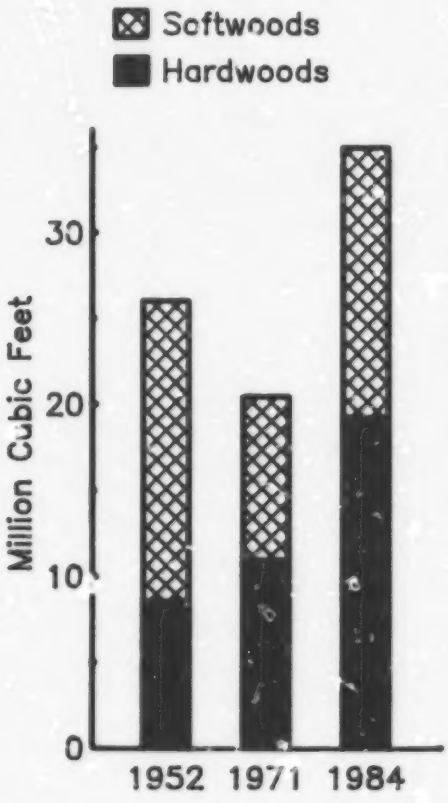

Figure 7.--Industrial timber harvest in southern New England, by species group, 1952, 1971, and 1984.

After a large decline in softwood sawlog production caused a large reduction in the region's 1971 timber harvest, the softwood harvest for all products rose between 1971 and 1984. The hardwood harvest rose faster and had a larger volume gain than the softwood harvest during the 1971-84 period. In 1984, hardwoods made up most of the sawlogs cut in the region and softwoods were used mostly for pulpwood and other products (Table 2).

Oaks accounted for more than one-third of the roundwood and two-thirds of the hardwood timber products from the region in 1984 (Fig. 8). White pine timber accounted for more than a third of the total harvest and three-fourths of the softwood harvest.

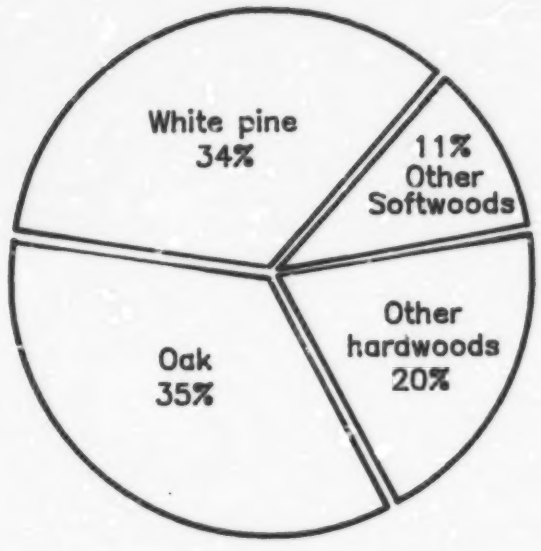

Figure 8.--Industrial timber harvest in southern New England in 1984, by species, in percent.

Lumber and Sawlog Segment

Demand Was Heavy

Both sawlog production and receipts in each southern New England state rose substantially between 1971 and 1984. Regional sawlog production doubled from 104.8 to 210.4 million board feet during the period. Although sawlog production more than doubled in Connecticut, the sawlog harvest in Massachusetts accounted for six-tenths of the volume gain in the region (Table 1). Regional sawlog receipts nearly doubled from 108.6 to 205.1 million board feet during the period. Log receipts increased most in Massachusetts, accounting for just over half of the gain in the region. The rises in production and receipts resulted from the increased volumes of both hardwood and softwood sawlogs cut and retained in each state for use by in-state sawmills.

Demand was heavy in 1984 for both hardwood and softwood lumber products as the economy continued to improve. Better timber, improved harvesting and manufacturing methods, and rising transportation costs have made regional lumber more competitive. Regional grading standards and the establishment of a northeastern lumber manufacturer's association have encouraged improvement of product quality and market expansion by increasing user confidence in well-manufactured regional lumber.

Hardwoods Rose Most

The demand for both hardwood and softwood sawlogs was not always as great and as evenly balanced as it was in 1984 (Table 3). Two-thirds of the sawlogs cut in the region in 1952 came from softwood trees. Between 1952 and 1971, demand for white pine box lumber dropped in the region, much more of the softwood construction lumber used in the Northeast came from the western and southern states and the Lake States, and demand for hardwood pallet lumber grew rapidly. By 1971, just over half of the sawlog harvest in southern New England was hardwood. In recent years, favorable lumber demand and pricing from improved manufacturing and marketing caused the harvest of both species groups, especially hardwoods, to rise considerably throughout the region.

Between 1971 and 1984, regional hardwood sawlog demand continued to grow and the harvest of these logs rose at a faster rate. While the softwood harvest nearly doubled since 1971, rising by 44.1 million board feet to 93.1 million board feet in 1984, the hardwoods doubled in volume harvested from 55.9 to 117.3 million board feet. The larger and more rapid gain in hardwood sawlog production caused the hardwood portion of the sawlog harvest to rise by 3 percent to 56 percent. In 1984, 65 percent of the hardwood logs were from oaks; four-fifths of the softwood logs were white pine; and each species accounted for 36 percent of all sawlogs produced in 1984.

Massachusetts Sawlogs Affected Harvests

Since 1952, both total production and sawlog harvests for the region have fluctuated with the sawlog harvests in Massachusetts, declining with decreased white pine harvests between 1952-71 and rising with increased harvests since

1971. Between 1971 and 1984, the volume of sawlogs harvested rose most in Massachusetts, where the sawlog harvest increased by nearly 61 million board feet to 134.5 million board feet (Table 3 and Fig. 2). During the same period, sawlog production rose by nearly 42 million board feet in Connecticut with 69.3 million board feet of sawlogs and by 3.0 million board feet to 6.6 million board feet in Rhode Island.

Despite the magnitude and effect of Massachusetts' sawlog harvests, the state's sawlog production seems to be losing some of its importance and effect on the region's sawlog and timber products output. Sawlog production has increased steadily in Connecticut and Rhode Island since 1952 (Fig. 2); and the sawlog harvest has risen the fastest in Connecticut, where the percentage of change was nearly twice that for the other two states in 1984 (Fig. 1).

Sawmills and Lumber Production Changed

Despite heavy urbanization and small size, the region has been an important lumber producer for over a century. In 1909, more than 1,100 sawmills in the region produced over 550 million board feet of lumber--both were record highs (Fig. 9). Sawlog harvests, lumber production, and the number of sawmills in southern New England plunged over the next 25 years with the depletion of the original forests and the collapse in the economy. Lumber production bottomed out in the region during the Depression as it did throughout the Northeast and the Nation. In 1932, less than 50 million board feet of lumber were produced by less than 125 sawmills. In less than quarter of a century, the lumber industry in southern New England had practically ceased; lumber production had dropped by 92 percent, and the number of operating sawmills by 80 percent. These trends within the region were representative of similar changes

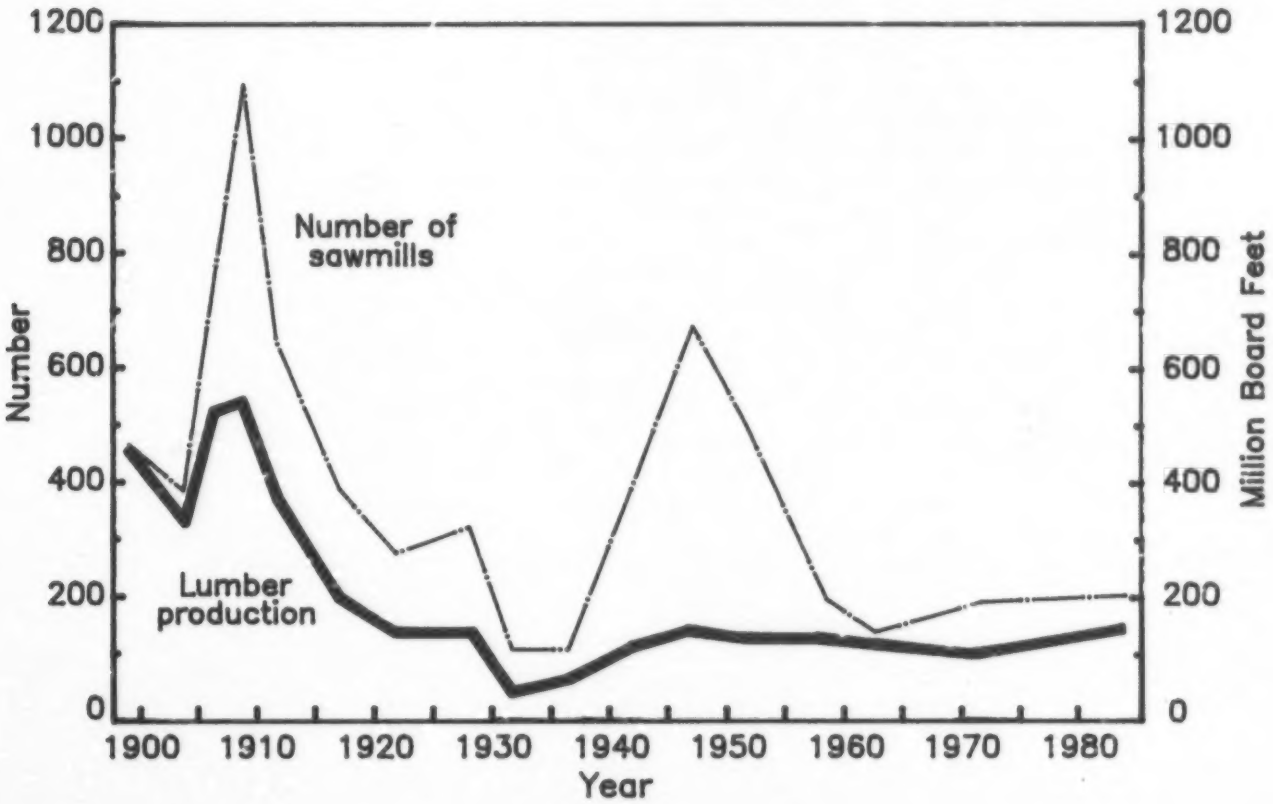

Figure 9.--Lumber production and number of sawmills in southern New England for selected years between 1899 and 1984.

occurring throughout the Northeast as much of the softwood lumber industry shifted from the region.

As the national economy improved, lumber production and the number of sawmills operating in southern New England rose quickly. Stimulated by increased wartime demand for raw materials, the region's lumber production almost quadrupled from 1932 to 1942. It reached over 400 million board feet in 1942 and continued to rise throughout the 1940's.

Post-war housing demand prompted increased lumber production and, by the end of the decade, there were almost 700 sawmills--5-1/2 times as many as in 1932--producing 155 million board feet of lumber, mostly for commerce and industry. By the early 1950's, the circumstances that had been responsible for the changes of the first half of the century had disappeared under normal economic conditions. Annual lumber production in southern New England declined slowly over the next 20 years as the demand for pine lumber for boxes, shipbuilding, and other special and industrial markets dropped. Favorable economic conditions; increased demand for local hardwood and softwood lumber, especially pallet material; and the construction of more large-capacity sawmills in the region have contributed to the current levels of production. In 1984, nearly 160 million board feet of lumber were manufactured in southern New England, following the rise in sawmill numbers, capacity, and lumber production throughout the Northeast.

As in most of the Northeast and the country, most of southern New England's lumber is made by high-production sawmills making more than 1 million board feet annually. In 1984, 67 mills were capable of producing more than 1 million board feet (Table 4). Nearly 70 percent of the 217 operating mills in the region in 1984 sawed less than 1 million board feet. Two-thirds of the high-production mills and over half of all the region's mills were located in Massachusetts.

Sawlog Exports Exceeded Imports

Most of the lumber sawn in the region in 1984 came from sawlogs harvested within the region. Overall, the region was a net exporter of sawlogs--slightly more logs were sent out of the region than were received from log processors outside the region (Table 5). Connecticut and Massachusetts were net exporters of sawlogs--considerably more roundwood was shipped out-of-state than was received in each state. Twice as many sawlogs were exported as were imported in Connecticut. Rhode Island was a large net importer in comparison--receiving 6 times its exported log volume. About half of the region's log movement was among the three states; and most of interregional shipments went to and from New Hampshire and New York. Massachusetts was by far the largest trader of both hardwood and softwood sawlogs--exporting 28 million board feet and importing 22.4 million board feet.

The 116 sawmills in Massachusetts sawed mostly softwood logs; while the 85 mills in Connecticut and the 16 mills in Rhode Island preferred to produce hardwood lumber, mostly for pallets. The Rhode Island mills imported more hardwoods than Connecticut and nearly as much as Massachusetts--and, they used more than 4 times as much hardwood as softwood logs. Sixty-three percent, or 128.9 million board feet, of the 205 million board feet of sawlogs received by the region's mills were used in Massachusetts. Thirty percent, or 61.2 million board feet, were used in Connecticut. About two-fifths of the region's sawlog receipts and nine-tenths of the hardwood sawlog receipts were from oaks. Nearly two-fifths of the total and two-thirds of the softwood receipts came from white pine.

Pulpwood Segment Dwindled

Pulpwood production has always been a minor segment of the timber industry in southern New England, never accounting for much more than 10 percent of the region's total timber products output

(Table 6 and Fig. 10). Since 1973, when the production of both softwood roundwood and pulp chips from mill residues peaked, pulpwood production in the region has been on a general decline, rarely fluctuating much above 50,000 cords. In recent years, very little roundwood of any species has been harvested for pulpwood. The bulk of the region's pulpwood production is from chippable manufacturing plant residues from Massachusetts. With the closing of the region's three pulpmills between early 1971 and late 1977, all of the region's pulpwood goes to mills in neighboring states.

Since 1971, total pulpwood production has dropped by 14 percent despite an increase in chipped residue production. By 1984, total production was just under 38,000 cords. The roundwood harvest had dropped to less than 14,000 cords--less than half of the 1971 harvest--and chip production had risen by 70 percent to 24,000 cords. The chipped residues came from manufacturing lumber, veneer, and other secondary manufactured wood products; and accounted for 63 percent of the region's pulpwood production.

Most of the region's pulpwood production has come from Massachusetts. In 1984, nearly four-fifths of the region's pulpwood was produced in the state. Massachusetts' production rose slightly between 1971 and 1984 from a sharp rise in chipped residue production despite a 12-percent drop in the state's roundwood harvest. By the end of the period, pulpwood was no longer harvested in Rhode Island, and Connecticut's harvest fell by 72 percent. All of the pulpwood harvested in the forests of Connecticut in 1984 came from softwoods. Nearly two-thirds of Massachusetts' harvest was from softwood trees.

Miscellaneous Products Segment Changed

Few small, family-owned, wood-product manufacturing plants exist in southern New England. Until the 1950's, the region was scattered with many manufacturers of a variety of products such as baskets, charcoal, excelsior, handles, rollers, dimension, shingles, turnings, and the like. With the development of new technologies and substitute products, demand for most of these items has disappeared and roundwood is required for other miscellaneous products, such as laminated and reconstituted-wood panel products.

Since 1971, the harvest of roundwood for products other than lumber or woodpulp has more than doubled in the region. In 1984, over 1.1 million cubic feet of roundwood were cut, mostly to supply panel manufacturers in neighboring states. Minor volumes were used within the region to make charcoal, dimension, handles, poles, and shingles. Fairly equal volumes of hardwoods and softwoods were used; with over half of each cut in Massachusetts. Most of the balance was cut in Connecticut. The harvest of miscellaneous roundwood more than doubled in Massachusetts, nearly doubled in Connecticut, and fell by nearly a third in Rhode Island.

Use of Manufacturing Residues

The manufacture of lumber and other solid wood products from roundwood generates residues in the form of bark, chips, slabs, clippings, cores, and the like. The value and utility of these primary wood manufacturing residues have continued to increase throughout the Northeast over the years. Economic and environmental considerations have discouraged burning these residues in the open, and have encouraged the plants to use the residues or make them available for others to use.

Most of the residues generated by the primary manufacturing plants, such as sawmills, in southern New England are used. These plants and many other industrial facilities in the region have been using the residue materials as readily available, dependable, alternative raw material sources for woodpulp and energy (Fig. 11). Gardeners, farmers, and landowners have been using much of the bark and smaller

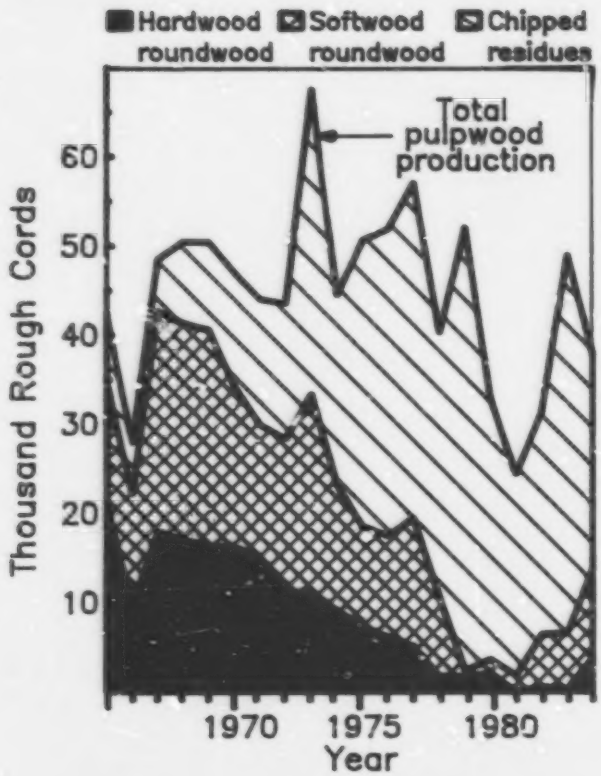

Figure 10.--Trends in pulpwood production in southern New England, 1965-84.

woody material for horticultural mulch and livestock bedding. Homeowners also have been using the larger material to heat their houses.

Most Residues Were Coarse Material

In 1984, over 19 million cubic feet of residues were generated by the primary wood manufacturers in southern New England. Four-fifths of the residues were coarse and fine woody material. Nearly six-tenths of the woody material was coarse material suitable for conversion into chips for wood pulp and fiber products. Nearly all of the bark and woody residues were used as pulpwood, fuelwood, or horticultural mulch and livestock bedding.

Residues Were From Sawmills

The region's 1984 residue production was closely related to the industrial roundwood production and receipts in the region and in each state. Nearly all of the residues came from sawlog conversion into lumber and most were from Massachusetts. Two-thirds of both the sawmill residues and the total residues generated in the region were from Massachusetts--which produced and consumed 64 percent of the region's sawlog harvest and receipts. Since 1971, sawmill residue and total residue volumes increased most in Connecticut and Rhode Island, which had the largest gains in sawlog receipts.

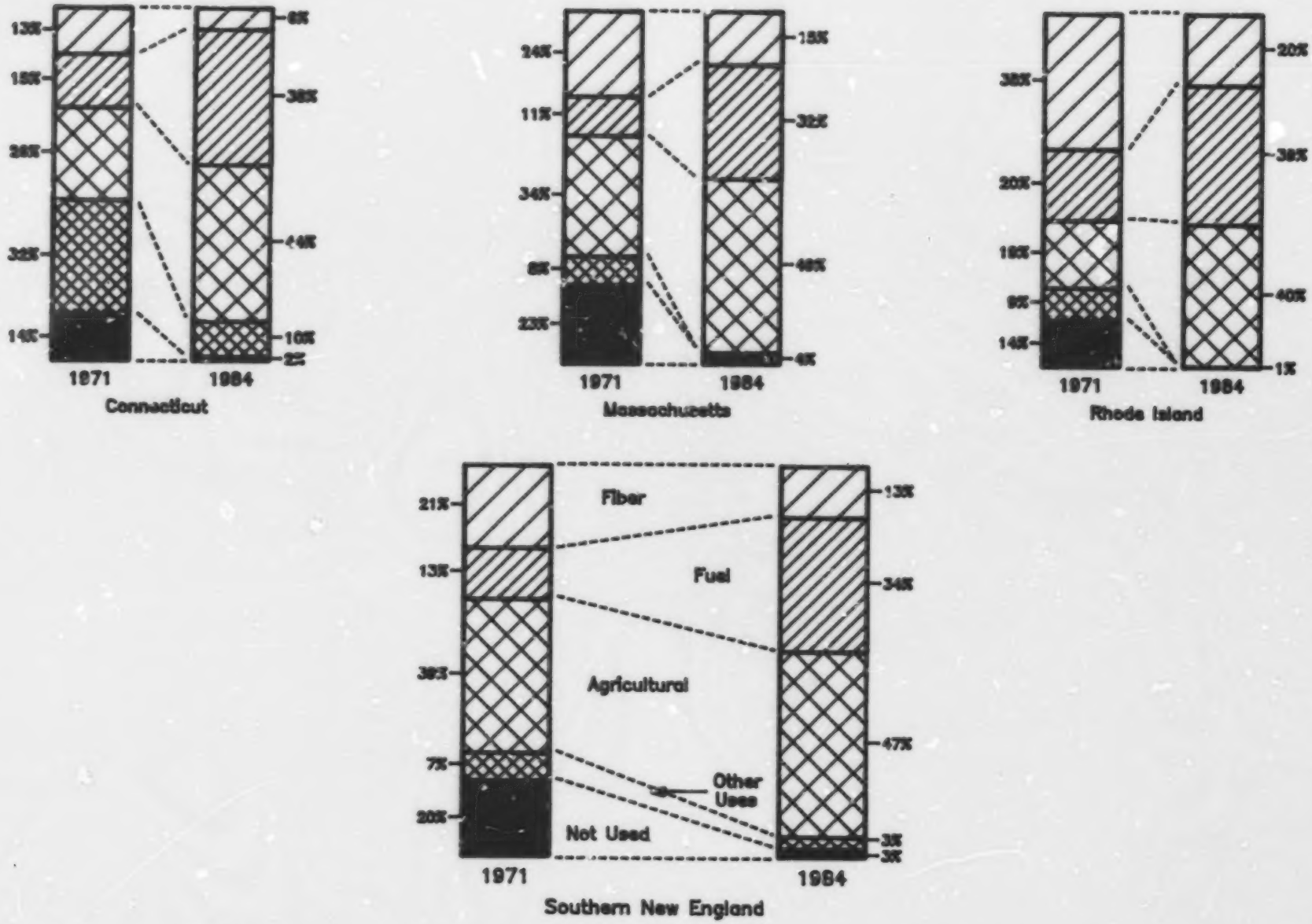

Figure 11.--Trends in the use of wood residue from southern New England sawmills, in percent, by state, 1971 and 1984.

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In 1984, nearly 19 million cubic feet (534,000 m^3) of residues were generated by the region's sawmills (Table 7). Just over 15 million cubic feet (426,000 m^3) of sawmill residues were woody material and nearly 9 million cubic feet (246,000 m^3) were chippable coarse residues suitable for wood-fiber production.

Sawmill Residue Use Jumped

Since 1971, the sawmills and other wood residue users in southern New England have made considerably more use of the wood residues generated in converting sawlogs into lumber. In 1971, the relation of coarse and fine residues used to the total sawmill residues available averaged 80 percent for the region (Fig. 11). The use of coarse residue was 69 percent, and the use of fine residue was 95 percent. In 1984, there was heavy demand for all types of residues, including bark, from the region:

Sawmill residue type	Volume generated	Fiber	Fuel	Agricultural	Other	All uses
	(Million ft^3)			Percent used		
Bark	3.8	4	36	53	4	97
Coarse	8.7	22	52	18	5	97
Fine	6.4	0	9	88	*	97
Total	18.9	11	34	49	3	97

*Less than 0.5 percent.

Most of the bark and nearly all of the fine sawmill residues were used in agriculture. Just over half of the coarse residue was used as fuel. Very little of either residue type went unused in any state in the region--97 percent of the residues generated by the three states were recovered and used. Of the three states, Rhode Island was slightly more successful in the recovery of most residues and total residues, and generated the least.

Over the years, throughout the region, the use of woody sawmill residues for fuel has increased substantially--rising faster and more than for any other purpose (Fig. 11). In 1971, only 1 million cubic feet of the region's coarse and fine residues from sawmilling were burned for fuel. At the time, 16 percent of the production of these residues and 13 percent of these residues that were recovered went for fuel. Thirteen years later, the utilization of these residues for fuel was nearly 5 times more--5.1 million cubic feet (Table 7). Wood residue use for fuel accounted for about 35 percent of its production and its utilization. Three-fourths of the remaining 7.1 million cubic feet of woody sawmill residues recovered in 1984 went for agricultural purposes, such as bedding, litter, and mulch. Most of the balance was made into woodpulp.

Regionally, woody sawmill residue use for agriculture also rose since 1971--substantially in terms of volume and slightly in relation to total use. In 1971, about 2.6 million cubic feet, less than half of the residues, ended up as bedding, litter, or mulch. In 1984, agricultural use of 7.1 million cubic feet accounted for over half of the residue utilization.

The volumes of residues from southern New England sawmills to make woodpulp

and to make charcoal have increased substantially over the years. For the neighboring pulpmills and Connecticut's single charcoal operation, a large part of the wood used for these products in recent years came from manufacturing plant residue rather than roundwood. Still, the portions of residue used for woodpulp and charcoal manufacture remains small in relation to other uses. Also, the proportions of residue used for pulpwood charcoal have decreased since 1971 in relation to other uses as the increased volume of residues for these purposes did not grow nearly as fast as that for agriculture and fuel.

As a result of increased residue use, both the volume and proportion of unused residue from the region's sawmills have dropped substantially in recent years. In 1971, 1.7 million cubic feet, or one-fifth of the wood residue, went unused. In 1984, about one-fourth as much--less than 440,000 cubic feet--went unused.

Agriculture Remained the Heaviest Use

Of the various uses for woody sawmill residue in 1984, agriculture remained the single most important--utilizing mostly fine material. Four-fifths of the woody sawmill material used for agriculture was sawdust, shavings, and the like. The use of wood residues for fuel has surpassed its use for fiber--demanding mostly coarse material. In 1971, wood fiber production from coarse residue nearly equalled the agricultural demand for fine material and utilized over half of the coarse residue. In 1984, nearly nine-tenths of the woody material used for fuel was coarse residue. Fiber production utilized the bulk of the uses for wood residue, using only coarse material. The production of charcoal required mostly coarse material and bark. Agriculture took more than half of the total of the bark residue from the region's sawmills.

Of the region's three states, Rhode Island and Connecticut mills seemed to be slightly more successful in the recovery of their residue. Massachusetts' mills showed the most improvement in efficiency of residue use--diminishing the portion of unused residue to total residues from 23 to 3 percent. The use of residue for fuel increased the most in relation to total use in Massachusetts; increased the most for agriculture in Rhode Island; and dropped the most for fiber production in Rhode Island. Most of the residues in each state were used for agricultural purposes, and most of the balance went for fuel.

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Appendix

Definition of Terms

Harvest

Harvest. The aggregate volume of timber produced for industrial or consumer uses.

Timber products output. Includes roundwood (round timber) products harvested from growing stock on commercial forest land; from other sources, such as cull trees, salvable dead trees, limbs and tops, and saplings; from trees on noncommercial and nonforest lands; and from manufacturing plant byproducts.

Industrial timber harvest. Total production of round timber for conversion into industrial wood products, except fuelwood.

Manufacture

Primary wood manufacturing plant. A plant that converts roundwood (round timber) to wood products such as woodpulp, lumber, veneer, cooperage, and dimension.

Roundwood products. Logs, bolts, and other round timber generated from harvesting trees for industrial or consumer use.

Industrial wood or roundwood. Logs, bolts, or other round timber generated from harvesting trees for use by the primary wood manufacturing industry, excluding round timber used to fuel industrial heating and power facilities.

Sawlog. A roundwood product, from which products such as lumber are sawn, and which meets certain standards of minimum diameter and length, and maximum defect, including a minimum 8-foot length and combination of size and defect specified in regional standards.

Pulpwood. Roundwood, mostly converted into 4- or 5-foot lengths, or chips and chipped plant residues that are used to make woodpulp.

Boltwood. Roundwood, mostly converted into 4- to 6-foot lengths, to be sawn into lumber at bolter-type sawmills, prepared for the manufacture of woodpulp, or used to make other products, such as cooperage, turned products, and veneer, from short, round timber.

Veneer log or bolt. A roundwood product from which veneer is sliced or sawn, and that usually meets certain standards of minimum diameter and length, and maximum defect.

Cabin logs. Relatively slender round timber products cut to standard sizes and meeting specifications of strength, straightness, and soundness, finished for use in constructing cabins, barns, and other buildings.

Piles (piling). Relatively slender structural round timber products cut to the maximum length possible within top-circumference and other specifications of strength, straightness, and soundness, to be driven or otherwise introduced into the soil, usually to provide vertical or lateral support in buildings, foundations, and other structures.

Poles. Round timber products cut to standard sizes and meeting specifications of strength, straightness, and soundness to be driven into the soil, usually to provide vertical or lateral support for electric power and telephone transmission lines.

Posts. Short, round timber products to be used in the upright position to support fence structures.

Roundwood production. The volume of roundwood (round timber) products, such as logs and bolts, harvested from trees for conversion into wood products.

Roundwood receipts. The volume of roundwood (round timber) products, such as logs and bolts, received by primary wood-manufacturing plants for conversion into wood products.

Residues

Manufacturing plant residues. Bark and woody materials that are generated when round timber (roundwood) is converted into wood products; includes slabs, edgings, trimmings, miscuts, sawdust, shavings, veneer cores and clippings, and pulp screenings.

Plant byproducts. Wood products such as pulp chips, recycled from manufacturing plant residue.

Unused manufacturing residues. Plant residues that are dumped or destroyed and not recovered from plant byproducts.

Coarse residues. Manufacturing residues suitable for chipping, such as slabs, edgings, and veneer cores.

Fine residues. Manufacturing residues not suitable for chipping, such as sawdust and shavings.

Species

Hardwoods. Dicotyledonous trees, usually broad-leaved and deciduous.

Softwoods. Coniferous trees, usually evergreen, with needles or scale-like leaves.

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Table 1--Change in industrial roundwood production in southern New England, by state and major product, 1971-84

State and year	Sawlogs	Pulpwood	Other Products[a]	All Products
	Thousand board feet[b]	Standard cords	Thousand cubic feet	Thousand cubic feet
Connecticut				
1971	27,658	10,849	242	5,803
1984	69,259	3,020	433[c]	11,574
Percent change	150	-72	79	99
Massachusetts				
1971	73,565	12,263	288	13,663
1984	134,484	10,867	682	22,503
Percent change	83	-11	137	65
Rhode Island				
1971	3,619	6,738	19	1,199
1984	6,644	-	13	1,052
Percent change	84	-100	-32	-12
Southern New England				
1971	104,842	29,850	549	20,665
1984	210,387	13,887	1,128	35,129
Percent change	101	-53	105	70

[a]Includes cabin logs, charcoal wood, piling, poles, posts, veneer logs and bolts, and stock for dimension, rollers, shingles, and reconstituted-wood panel products.
[b]International 1/4-inch rule.
[c]Includes 51,000 cubic feet of roundwood for conversion to chips for reconstituted-wood panel products.

Table 2--Industrial roundwood production in southern New England, by state, species group, and major product, 1984

State and year	Sawlogs	Pulpwood	Other Products[a]	All Products
	Thousand board feet[b]	Standard cords	Thousand cubic feet	Thousand cubic feet
Connecticut				
Softwood	15,345	3,020	263	2,869
Hardwood	53,914	-	170[c]	8,705
Total	69,259	3,020	433	11,574
Massachusetts				
Softwood	75,389	7,033	321	12,461
Hardwood	59,095	3,834	361	10,042
Total	134,484	10,867	682	22,503
Rhode Island				
Softwood	2,354	-	-	360
Hardwood	4,290	-	13	692
Total	6,644	-	13	1,052
Southern New England				
Softwood	93,008	10,053	584	15,690
Hardwood	117,299	3,834	544	19,439
Total	210,307	13,887	1,128	35,129

[a]Includes cabin logs, charcoal wood, piling, poles, posts, veneer logs, and bolts, and stock for dimension, rollers, shingles, and reconstituted-wood panel products.
[b]International 1/4-inch rule.
[c]Includes 51,000 cubic feet of roundwood for conversion to chips for reconstituted-wood panel products.

Table 3--Change in species composition of sawlog harvests in southern New England, by state and major species group, 1952-71 and 1971-84.

State and species	Sawlog production 1952		Sawlog production 1971		Change 1952-71	Sawlog production 1984		Change 1971-84
	Thousand Board Ft.[a]	Percent	Thousand Board Ft.[a]	Percent	Percent	Thousand Board Ft.[a]	Percent	Percent
Connecticut								
White and red pine	5,131	22	4,022	15	-22	10,178	15	(b)
Other softwoods[c]	2,993	13	1,987	7	-34	5,167	7	(b)
Total softwoods	8,124	35	6,009	22	-26	15,345	22	(b)
Oaks	11,584	50	15,598	56	35	35,181	50	(b)
Birch-beech-maple	1,624	7	1,852	7	14	12,942	19	(b)
Yellow-poplar	1,040	4	517	2	-50	1,249	2	(b)
Other hardwoods[d]	1,001	4	3,682	13	(b)	4,542	7	23
Total hardwoods	15,249	65	21,649	78	+42	53,914	78	(b)
All species	23,373	100	27,658	100	+18	69,259	100	(b)
Massachusetts								
White and red pine	59,722	53	33,189	45	-44	66,225	49	+100
Hemlock	17,082	15	8,406	11	-51	6,164	5	-26
Other softwoods[e]	6,941	6	408	1	-94	3,000	2	(b)
Total softwoods	83,745	74	42,003	57	-50	75,389	56	+79
Oaks	11,231	10	17,053	24	+52	37,663	28	(b)
Birch-beech-maple	10,059	9	5,850	8	-42	9,900	7	+69
Paper birch	3,210	3	332	(f)	-90	1,064	1	(b)
Other hardwoods[g]	4,791	4	8,327	11	(b)	10,468	8	26
Total hardwoods	29,291	26	31,562	43	+8	59,095	44	+87
All species	113,036	100	73,565	100	-35	134,484	100	+82

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Table 3--Continued

State and species	Sawlog production 1952		Sawlog production 1971		Change 1952-71	Sawlog production 1984		Change 1971-84
	Thousand Board Ft.[a]	Percent	Thousand Board Ft.[a]	Percent	Percent	Thousand Board Ft.[a]	Percent	Percent
Rhode Island								
White pine[h]	154	6	914	25	(b)	2,164	32	(b)
Other softwoods[i]	3	(f)	50	2	(b)	190	3	(b)
Total softwoods	157	6	964	27	(b)	2,354	35	(b)
Oaks	2,323	93	2,356	65	+1	3,811	57	+62
Birch-beech-maple	20	1	77	2	(b)	372	6	(b)
Other hardwoods[j]	5	(f)	222	6	(b)	107	2	-52
Total hardwoods	2,348	94	2,655	73	+3	4,290	65	+62
All species	2,505	100	3,619	100	+44	6,644	100	+84
Southern New England								
White and red pine	65,007	47	38,125	37	-41	78,567	37	(b)
Other softwoods	27,019	19	10,851	10	-60	14,521	7	37
Total softwoods	92,026	66	48,976	47	-47	93,088	44	+90
Oaks	25,138	18	35,007	33	+39	76,655	36	(b)
Birch-beech-maple	14,913	8	8,111	8	-34	24,278	12	(b)
Other hardwoods	6,837	8	12,748	12	+10	16,366	8	+35
Total hardwoods	46,888	34	55,866	53	+19	117,299	56	(b)
All species	138,914	100	104,842	100	(b)	210,387	100	(b)

[a]International 1/4-inch rule.
[b]Greater than 100 percent change.
[c]Includes cedar, fir, hemlock, and spruce.
[d]Includes ash, aspen, basswood, cherry, elm, and hickory.
[e]Includes cedar, fir, and spruce.
[f]Less than 0.5 percent.
[g]Includes ash, aspen, basswood, cherry, elm, hickory, and yellow-poplar.
[h]Includes minor amounts of red pine.
[i]Includes minor amounts of hemlock and other species.
[j]Includes ash, elm, and yellow-poplar.

Table 4--Number of operating sawmills in southern New England, by state and production class, 1952, 1971, and 1984

Production class[a]	1952	1971	1984
Connecticut:			
Under 500,000 board feet	102	51	52
500,000 to 999,000 board feet	15	4	15
1 million board feet or over	3	8	18
All production classes	120	63	85
Massachusetts:			
Under 500,000 board feet	282	76	50
500,000 to 900,000 board feet	49	24	21
1 million board feet or over	34	23	45
All production classes	365	123	116
Rhode Island:			
Under 500,000 board feet	(b)	(b)	10
500,000 to 900,000 board feet	30[b]	18[b]	2
1 million board feet or over	-	1	4
All production classes	30	19	16
Southern New England			
Under 1 million board feet	478	173	150
1 million board feet	37	32	67
All production classes	515	205	217

[a] Based on sawlog receipts or reported lumber production capacity.
[b] More specific break-down for mills under 1 million board feet is unavailable for 1952 and 1971 for Rhode Island.

Table 5--Sawlog production and receipts in southern New England, by state, species group, and destination and origin of shipment, 1984

(In thousands of board feet, International 1/4-inch rule)

State and species group	Cut and retained in state	Shipped to other states	Total production	Received from other states	Total receipts	Net export (+) import (-)
Connecticut						
Softwood	12,785	2,560	15,345	1,647	14,432	+913
Hardwood	40,660	13,254	53,914	6,119	46,779	+7,135
Total	53,445	15,814	69,259	7,766	61,211	+8,048
Massachusetts						
Softwood	61,343	14,046	75,389	12,144	73,487	+1,902
Hardwood	45,135	13,960	59,095	10,306	55,441	+3,654
Total	106,478	28,006	134,484	22,450	128,928	+5,556
Rhode Island						
Softwood	2,093	261	2,354	729	2,822	-468
Hardwood	3,103	1,187	4,290	8,990	12,093	-7,803
Total	5,196	1,448	6,644	9,719	14,915	-8,271
Southern New England						
Softwood	76,221	16,867	93,088	14,520	90,741	+2,347
Hardwood	88,898	28,401	117,299	25,415	114,313	+2,986
Total	165,119	45,268	210,387	39,935	205,054	+5,333

Table 6--Pulpwood production in southern New England, by state and type of pulpwood, 1965-84

(In thousands of rough cords)[a]

State and year	All types	Type of pulpwood		
		Roundwood		Chipped residues[b]
		Softwoods	Hardwoods	
Connecticut:				
1965	12.7	6.8	5.9	-
1966	8.4	6.1	2.3	-
1967	14.1	7.0	7.1	-
1968	13.7	6.6	7.1	-
1969	14.5	6.7	7.1	0.7
Total, 5 years	63.4	33.2	29.5	0.7
1970	13.5	5.9	7.4	0.2
1971	10.8	4.2	6.6	-
1972	9.7	4.6	4.6	.5
1973	10.8	5.1	3.9	1.8
1974	9.5	4.1	3.0	2.4
Total, 5 years	54.3	23.9	25.5	4.9
1975	8.0	3.4	2.4	2.2
1976	8.6	4.3	1.9	2.4
1977	9.8	4.6	1.7	3.5
1978	11.1	4.4	.6	6.1
1979	8.3	.6	-	7.7
Total, 5 years	45.8	17.3	6.6	21.9
1980	5.5	0.7	-	4.8
1981	5.9	1.0	-	4.9
1982	8.1	2.6	-	5.5
1983	9.3	1.5	-	7.8
1984	6.9	3.0	-	3.9
Total, 5 years	35.7	8.8	-	26.9

Table 6--Continued

(In thousands of rough cords)[a]

State and year	All types	Type of pulpwood		
		Roundwood		Chipped residues[b]
		Softwoods	Hardwoods	
Massachusetts:				
1965	24.1	5.1	11.4	7.6
1966	16.7	4.9	6.1	5.7
1967	26.7	13.1	7.8	5.8
1968	29.1	13.1	6.8	9.2
1969	26.9	13.0	6.1	7.8
Total, 5 years	123.5	49.2	38.2	36.1
1970	25.5	8.8	5.6	11.1
1971	24.7	8.9	3.4	12.4
1972	27.5	11.6	2.9	13.0
1973	49.4	15.4	3.3	30.7
1974	30.8	9.1	2.9	18.8
Total, 5 years	157.9	53.8	18.1	86.0
1975	39.2	7.1	2.2	29.9
1976	40.6	6.4	2.1	32.1
1977	44.6	9.0	1.5	34.1
1978	28.1	4.1	.5	23.5
1979	43.8	-	1.7	42.1
Total, 5 years	196.3	26.6	8.0	161.7
1980	27.5	0.8	2.2	24.5
1981	18.4	.8	-	17.6
1982	23.3	3.2	.5	19.5
1983	39.7	4.8	.3	34.6
1984	29.3	7.0	3.8	18.5
Total, 5 years	138.2	16.6	6.9	114.7

Table 6--Continued

(In thousands of rough cords)[a]

State and year	All types	Type of pulpwood		
		Roundwood		Chipped residues[b]
		Softwoods	Hardwoods	
Rhode Island:				
1965	5.6	1.7	3.9	-
1966	2.7	1.6	1.1	-
1967	7.7	4.6	3.1	-
1968	7.7	4.6	3.1	-
1969	9.0	4.6	3.1	1.3
Total, 5 years	32.7	17.1	14.3	1.3
1970	8.0	3.3	3.2	1.5
1971	8.5	1.8	5.0	1.7
1972	6.3	1.0	3.6	1.7
1973	7.4	1.6	4.1	1.7
1974	4.1	.9	3.2	-
Total, 5 years	34.3	8.6	19.1	6.6
1975	3.4	0.7	2.7	-
1976	2.7	.6	2.1	-
1977	2.7	.8	1.9	-
1978	1.0	.4	.6	-
1979	-	-	-	-
Total, 5 years	9.8	2.5	7.3	-
1980-83	-	-	-	-
1984	1.6	-	-	1.6
Total, 5 years	1.6	-	-	1.6

Table 6--Continued

(In thousands of rough cords)[a]

State and year	All types	Type of pulpwood		
		Roundwood		Chipped residues[b]
		Softwoods	Hardwoods	
Southern New England				
1965	42.4	13.6	21.2	7.6
1966	27.8	12.6	9.5	5.7
1967	48.5	24.7	18.0	5.8
1968	50.5	24.3	17.0	9.2
1969	50.4	24.3	16.3	9.8
Total, 5 years	219.6	99.5	82.0	38.1
1970	47.0	18.0	16.2	12.8
1971	44.0	14.9	15.0	14.1
1972	43.5	17.2	11.1	15.2
1973	67.6	22.1	11.3	34.2
1974	44.4	14.1	9.1	21.2
Total, 5 years	246.5	86.3	62.7	97.5
1975	50.6	11.2	7.3	32.1
1976	51.9	11.3	6.1	34.5
1977	57.1	14.4	5.1	37.6
1978	40.2	8.9	1.7	29.6
1979	52.1	0.6	1.7	49.8
Total, 5 years	251.9	46.4	21.9	183.6
1980	33.0	1.5	2.2	29.3
1981	24.3	1.8	-	22.5
1982	31.4	5.8	.6	25.0
1983	49.0	6.3	.3	42.4
1984	37.8	10.0	3.8	24.0
Total, 5 years	175.5	25.4	6.9	143.2

[a] 128 cubic feet of wood, bark, and air space, or 85 cubic feet of solid wood.

[b] Rough-cord equivalents.

Table 7--Production and disposition of sawmill residues in southern New England, by state, type of residue, and type of use, 1984

State and type of residue	Type of use						Total residues	Relationship of used residues to total residues
	Fiber[a]	Agricultural[b]	Fuel	Other[c]	All uses	No use		
	Thousand cubic feet							Percent
Connecticut								
Bark	84	434	565	-	1,083	32	1,115	97
Coarse[d]	247	330	1,583	456[e]	2,616	70	2,686	97
Fine[f]	-	1,614	101	8	1,723	9	1,732	99
Total	331	2,378	2,249	464[e]	5,422	111	5,533	98
Massachusetts								
Bark	61	1,529	751	122	2,463	84	2,547	97
Coarse	1,511	1,167	2,692	5	5,375	175	5,550	97
Fine	-	3,758	462	13	4,233	177	4,410	96
Total	1,572	6,454	3,905	140	12,071	436	12,507	97
Rhode Island								
Bark	-	90	50	-	140	2	142	99
Coarse	136	50	264	-	450	5	455	99
Fine	-	221	-	-	221	3	224	99
Total	136	361	314	-	811	10	821	99
Southern New England								
Bark	145	2,053	1,366	122	3,686	118	3,804	97
Coarse	1,894	1,547	4,539	461	8,441	250	8,691	97
Fine	-	5,593	563	21	6,177	189	6,366	97
Total	2,039	9,193	6,468	604	18,304	557	18,861	97

[a]Includes woodpulp and composite products.
[b]Includes livestock bedding, chicken litter, and farm and horticultural mulch.
[c]Includes miscellaneous uses such as small dimension and specialty items.
[d]Includes slabs, edgings, trimmings, veneer cores, and other material suitable for chipping.
[e]Includes 450,000 cubic feet to make charcoal.
[f]Includes sawdust, shavings, and other material considered unsuitable for chipping.

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Round Timber Conversions for Major Products

Softwood sawlogs and veneer logs: M bf(International 1/4-inch rule) = 153.1 ft^3 = 4.34 m^3

Hardwood sawlogs and veneer logs: M bf(International 1/4-inch rule) = 158.3 ft^3 = 4.48 m^3

Pulpwood and turnery bolts: 1 standard cord = 85 ft^3 of solid wood = 2.41 m^3 = about 5.4 green tons for hardwoods and about 3.6 green tons for softwoods

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Nevel, Robert L., Jr.; Wharton, Eric H. 1988. The timber industries of southern New England--a periodic assessment of timber output. Resour. Bull. NE-101. Broomall, PA: U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station. 28 p.

Evaluates regional timber output based on the results of a survey of the timber industries of southern New England. Contains statistics on industrial timber production and receipts in Connecticut, Massachusetts, and Rhode Island, by state and species, log shipments between states, sawmills and lumber production, and the production and disposition of manufacturing residues. Comparisons are made with historical and recent data, and trends in industrial wood output are noted. Includes graphics and statistical tables.

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Keywords: timber output, industrial timber harvest, roundwood, Connecticut manufacturers, Massachusetts manufacturers, Rhode Island manufacturers, wood residue use, southern New England, production/consumption statistics

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